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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,999	12/12/2003	Eugene Marsh	MI22-2461	1993

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WELLS ST. JOHN P.S.
601 W. FIRST AVENUE, SUITE 1300
SPOKANE, WA 99201

EXAMINER

DUONG, KHANH B

ART UNIT PAPER NUMBER

2822

DATE MAILED: 10/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/734,999	Applicant(s) MARSH ET AL.	
	Examiner Khanh B. Duong	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-101 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38-51, 71, 74 and 77-84 is/are allowed.
- 6) ☒ Claim(s) 52, 54-57, 59-64, 67, 68, 70, 72, 73, 75, 76, 86-89, 91-95, 98, 99 and 101 is/are rejected.
- 7) ☒ Claim(s) 53, 58, 65, 66, 69, 85, 90, 96, 97 and 100 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/14/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 14, 2006 has been entered.

Accordingly, claims 38-101 remain pending.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on February 14, 2006 was filed after the mailing date of the Notice of Allowance on January 13, 2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Allowable Subject Matter

Prosecution on the merits of this application is reopened on claims 52, 54-57, 59-64, 67, 68, 70, 72, 73, 75, 76, 86-89, 91-95, 98, 99 and 101 considered unpatentable for the reasons indicated below:

Upon further consideration, previously cited U.S. Patent No. 6,720,027 to Yang et al. has been found to anticipate the claims above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 52, 54-57, 59-64, 67, 68, 70, 72, 73, 75, 76, 86-89, 91-95, 98, 99 and 101 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (U.S. 6,720,027).

Re claim 52, Yang et al. ("Yang") expressly discloses in Fig. 2F [see illustration below] a deposition method comprising: positioning a semiconductor substrate within a deposition chamber; flowing a first precursor gas 410 within the deposition chamber to form a first monolayer on the substrate; after forming the first monolayer on the substrate, flowing a second precursor gas 420 different in composition from the first precursor gas 410 within the deposition chamber to form a second monolayer on the first monolayer, said second precursor gas 420 flowing comprising a plurality of time spaced second precursor gas pulses 423; and after forming the second monolayer on the substrate, flowing a third precursor gas 430 different in composition from the second precursor gas 420 within the deposition chamber to form a third monolayer on the substrate, the third precursor 430 being different in composition from the first precursor 410.

Re claim 54, Yang expressly discloses in Fig. 2F at least one period of time between two adjacent second precursor gas pulses 423 when some gas (410 or 440) is fed to the chamber.

Re claim 55, Yang expressly discloses in Fig. 2F at least one period of time between two adjacent second precursor gas pulses 423 within which at least one inert purge gas pulse 443B is fed to the substrate within the chamber.

Re claims 56 and 57, Yang expressly discloses in Fig. 2F the plurality of time spaced second precursor gas pulses 423 being two. Yang further discloses in Fig. 6 the number of pulses 423 will be more than two if the process steps 606 and 608 are repeated until a predetermined number of cycles are performed to form a first sub-layer [see col. 13, line 51 to col. 14, line 1].

Re claims 59 and 60, Yang expressly discloses in Fig. 2F the plurality of time spaced second precursor gas pulses 423 being two, and comprising a period of time between said two when some gas (e.g. first precursor 413 and inert gas 443B) is fed to the chamber.

Re claims 61 and 62, Yang expressly discloses in Fig. 2F flowing multiple inert purge gas pulses 443A to the substrate within the chamber intermediate the first precursor flowing 413 and the third precursor flowing 433.

Re claim 63, see discussion above regarding claim 52. In addition, Yang expressly discloses in Fig. 2F the second precursor gas flowing comprising at least two time abutting second precursor gas pulses which are characterized by different flow rates of the second precursor (relative to the flow rates of the first precursor).

Re claim 64, Yang expressly discloses in Fig. 2F the two time abutting second precursor gas pulses 423 are equal in time.

Re claims 67 and 68, see discussions above regarding claims 61 and 62.

Re claim 70, Yang discloses the third precursor is different in composition from the first precursor in order to form a ternary material [see col. 3, lines 16-23].

Re claims 72 and 73, Yang expressly discloses in Fig. 8A the second monolayer 670 is formed over an area of the substrate 600, the second monolayer 670 being continuously formed over the area.

Re claim 75, see discussions above regarding claim 52.

Re claim 76, see discussions above regarding claim 63.

Re claim 86, see discussions above regarding claim 54.

Re claim 87, see discussions above regarding claim 55.

Re claims 88 and 89, see discussions above regarding claims 56 and 57.

Re claim 91, see discussions above regarding claims 59 and 60.

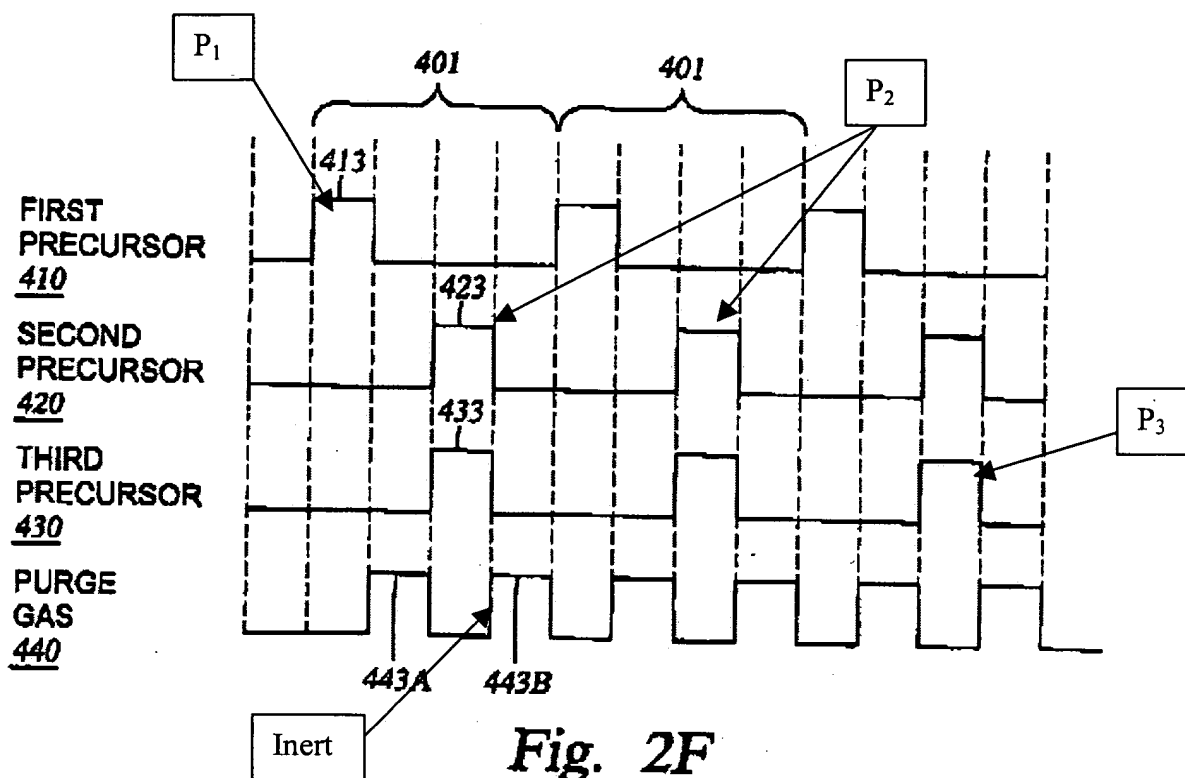
Re claim 92, see discussions above regarding claim 55.

Re claims 93 and 94, see discussions above regarding claims 61 and 62.

Re claim 95, see discussion above regarding claim 64.

Re claims 98 and 99, see discussions above regarding claims 61 and 62.

Re claim 101, see discussions above regarding claim 70.



Allowable Subject Matter

Claims 53, 58, 65, 66, 69, 85, 90, 96, 97 and 100 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 38-51, 71, 74 and 77-84 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record, taken alone or in combination, fairly shows or suggests all the limitations as claimed.

Re claim 38, none of the prior art of record discloses a deposition method comprising the following limitations in combination with the rest of the limitations of the claim: flowing multiple time spaced inert purge gas pulses within the deposition chamber intermediate the

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flowing of the first precursor gas and the second precursor gas, said multiple time spaced inert purge gas pulses being characterized by a period of time between two adjacent of the multiple time spaced inert purge gas pulses which is void of flowing the first precursor gas and the second precursor gas to the chamber.

Re claim 40, none of the prior art of record discloses a deposition method comprising the following limitations in combination with the rest of the limitations of the claim: flowing a first precursor gas within the deposition chamber to form a first monolayer on the substrate, said first precursor gas flowing comprising a plurality of first precursor gas pulses, at least two of the plurality of first precursor gas pulses separated by a period of time when no gas is fed to the chamber, the plurality being more than two during formation of the first monolayer.

Re claim 74, none of the prior art of record discloses a deposition method comprising the following limitations in combination with the rest of the limitations of the claim: flowing multiple time spaced inert purge gas pulses within the deposition chamber intermediate the flowing of the first precursor gas and the second precursor gas, said multiple time spaced inert purge gas pulses being characterized by a period of time between two adjacent of the multiple time spaced inert purge gas pulses which is void of flowing the first precursor gas and the second precursor gas to the chamber.

Re claim 77, none of the prior art of record discloses a deposition method comprising the following limitations in combination with the rest of the limitations of the claim: after forming the first monolayer on the substrate, flowing a second precursor gas different in composition from the first precursor gas within the deposition chamber to form a second monolayer on the

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first monolayer, said second precursor gas flowing comprising a volumetric gas flow rate which varies across a duration of second precursor gas flowing within the deposition chamber.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KBD


Zandra V. Smith
Supervisory Patent Examiner
18 Sept. 2010